REMARKS

Claims 1-11, 13-19, 21-27, 29-34, 37-41, and 44-63 are presently pending in the application. Of these, claims 1, 21, 37, 44, 54, 56, 57, 61, and 62 are independent. Claims 1-9, 18-19, 21-25, 31-34, 37, 41, 44, and 48-53 stand rejected under 35 U.S.C. § 102 and § 103. Claims 10-11, 13-17, 26-27, 29-30, 38-40, and 45-47 have been indicated to contain allowable subject matter, but are objected to as being dependent upon a rejected claim. By this amendment, claims 1, 21, 37, and 44 have been amended to better define the invention; claims 12, 20 28, 35, 36, 42, and 43 have been canceled, and claims 54-63 are new.

The Applicant is appreciative of the examiner's recognition that claims 10-11, 13-17, 26-27, 29-30, 38-40, and 45-47 include allowable subject matter. Claims 10, 13, 14, 45, and 46 have been rewritten in independent form as new claims 54, 56, 57, 61, and 62, respectively. Claims 11, 15, 16, 17, and 47 have also been rewritten as new claims 55, 58, 59, 60, and 63, respectively. The Applicant submits that all of the pending claims are now in condition for allowance.

35 U.S.C. § 102 Rejections

Claims 1-9, 21-25, 37 and 44 stand rejected under 35 U.S.C. § 102 as anticipated by Dhindsa et al., U.S. Patent No. 5,846,056 ("Dhindsa"). The Applicant respectfully traverses this rejection, and the assertions and determinations therein, for at least the following reasons.

Claim 1 recites, in part, "a monitoring routine adapted to be executed on the processor that uses the one or more operating parameters and the characteristic curve to estimate the presence of cavitation within the device and to alert an operator to the presence of cavitation within the device." Claims 21, 37, and 44 include similar recitations directed to the use of a characteristic curve to estimate the presence of cavitation and alert an operator to the presence of cavitation within the device. The cited art fails to disclose or suggest such use of characteristic curves to estimate the presence of cavitation and alerting an operator to the presence of cavitation within a device.

Although Dhindsa discloses a need to determine whether cavitation is present and "to provide warning to the operator about the existence of such a condition" (col. 2, lines 50-58), Dhindsa does not, as the examiner suggests, teach alerting a user to the presence of cavitation in a device and Dhindsa fails to disclose or suggest the use of a characteristic curve to estimate the presence of cavitation. Dhindsa does not disclose how to determine the presence of cavitation, let alone alert an operator to the presence of cavitation. Specifically, Dhindsa

discloses alerting an operator to "certain abnormal operating conditions" (col. 8, lines 42-53). Dhindsa does not disclose, in any way, how to distinguish between cavitation and other abnormal operating conditions, let alone alert an operator to the presence of cavitation.

Further, while Dhindsa discloses comparing the actual pressure response curve to the normal pressure response curve (col. 7, lines 43-45) to determine a pump malfunction (col. 7, lines 33-35), Dhindsa does not disclose how to determine what is causing the malfunction, only that a malfunction exists. In other words, there is no way for an operator to tell if the malfunction is due to the discharge valve being stuck open, or partially open (col. 7, lines 35-37) or if the malfunction is due to cavitation. Dhindsa only mentions cavitation as one possible cause of a pump malfunction (col. 2, lines 50-54). The examiner also cites col. 3, lines 18-29 as estimating the presence of cavitation within the device. However, this passage only discloses a need to provide adequate information on whether a pump is malfunctioning (col. 3, lines 22-23), and no reference is made in col. 3 to cavitation whatsoever. The examiner further cites col. 8, lines 42-53 as disclosing a device for estimating the presence of cavitation; again, this passage only alerts the operator to "certain abnormal conditions" (col. 8, lines 47-49), not to cavitaiton. Lastly, the examiner cites col. 11, lines 18-24 as disclosing the use of a characteristic curve to estimate the presence of cavitation. Again, no mention of cavitation exists in this passage.

Additionally, while Dhindsa discloses that cavitation may be a cause for a pump malfunction (col. 2, lines 50-54), the Dhindsa system is directed to detecting only a pump malfunction, not cavitation specifically. Therefore, Dhindsa does not disclose a monitoring system that uses the characteristic curve to estimate the presence of cavitation and to alert an operator to the presence of cavitation as is recited in each of claims 1-9, 21-25, 37 and 44, and hence, none of claims 1-9, 21-25, 37 and 44 can be anticipated by Dhindsa.

The system of Dhindsa is directed to detecting a malfunctioning reciprocating pump (col. 3, lines 41-42). Cavitation is only mentioned as one possible cause for the piston pump to malfunction. The system of Dhindsa only generates alarms if a parameter is outside a predetermined range (col. 8, lines 44-50), and the operator must then interpret the data and solve the problem. Because Dhindsa fails to disclose a monitoring routine adapted to be executed on the processor that uses the one or more operating parameters and the characteristic curve to estimate the presence of cavitation and to alert an operator to cavitation within the device, as is recited in each of claims 1-19, 21-34, 37-41, and 44-53, none of claims 1-19, 21-34, 37-41, and 44-53 can be anticipated by Dhindsa.

35 U.S.C. § 103 Rejections

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). MPEP 2143.

Still further, it is clear that the prior art must make a suggestion of or provide an incentive for a claimed combination of elements to establish a *prima facie* case of obviousness. *See, In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). This principle holds true even if the applied art could be modified to produce the invention recited by the pending claims. *See, In re Mills,* 16 U.S.P.Q.2d 1430, 1432 (Fed. Cir. 1990); *In re Gordon,* 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.")

Claims 18-19, 31-32, 41, 49 and 53 stand rejected as obvious over Dhindsa in view of U.S. Patent No. 6,757,665 to Unsworth et al. ("Unsworth"). Claims 33-34 stand rejected as obvious over Dhindsa in view of Unsworth and further in view of U.S. Patent No. 5,161,110 to Dorchak ("Dorchak"). As set forth in detail above with respect to the claim rejections based on anticipation by Dhindsa, that reference fails to disclose or suggest the use of characteristic curves to estimate the presence of cavitation and to alert an operator to cavitation within the device. Dorchak fails to make up for the deficiencies of Dhindsa and there is no motivation to combine Dhindsa and Unsworth.

Dorchak does not address cavitation in any manner, and does not even mention cavitation in the disclosure. Further, Dorchak does not disclose or suggest the use of a characteristic curve. The Dorchak system only compares an input signal to a predetermined operating range (col. 3, lines 38-41). Therefore, Dorchack does not make up for the deficiencies of Dhindsa mentioned above.

Further, there is no motivation to combine Unsworth and Dhindsa. Dhindsa discloses a reciprocating pump system including a pressure sensor (col. 3, lines 41-42), a temperature sensor (col. 3, line 58) and a vibration sensor (col. 5, lines 9-10). Dhindsa makes no mention of using voltage or current characteristics of either the pump or motor to determine when a pump is malfunctioning.

Unsworth, on the other hand, discloses a system for condition monitoring synthesized fault data wherein the fault data relates to an operating condition of the pump which is encoded in variations of current of the motor driving the pump (col. 2, lines 26-31). In other words, Unsworth only uses pump motor current to determine if a pump is malfunctioning. Additionally, Unsworth teaches away from using pressure as a tool to diagnose pump failure. Unsworth states that "other efforts have looked at performing pump diagnostics using process instrumentation such as flow meters and pressure transducers" (col. 2, lines 4-6) and that "there is a strong need in the art for a system and/or method for condition monitoring which mitigates some of the above-noted problems associated with conventional pump monitoring systems and/or methods" (col. 2, lines 19-22).

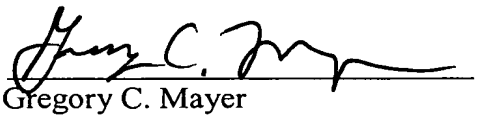
Because Dhindsa does not recognize the possibility of solving the problem of diagnosing pump malfunctions by using pump motor current, and Unsworth teaches away from using pressure transducers to perform pump diagnostics, there can be no motivation to combine the disclosures. Accordingly, the rejection of claims 18-19, 31-32, 41, 49 and 53 as obvious over Dhindsa in view of Unsworth is improper and should be withdrawn.

Conclusion

For the foregoing reasons, reconsideration and withdrawal of the rejections of the claims and allowance thereof is respectfully requested. Should the examiner wish to discuss the foregoing, or any matter of form, in an effort to advance this application towards, allowance, the examiner is urged to telephone the undersigned at the indicated number. Enclosed, please find a check in the amount of $950.00 for the net increase of 4 independent claims and 3 dependent claims. If there are any additional fees or refunds required, the Commissioner is directed to charge or credit Deposit Account No. 13-2855 of Marshall, Gerstein & Borun LLP. A copy of this paper is enclosed herewith.

Respectfully submitted,

MARSHALL, GERSTEIN & BORUN LLP

By: 

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